

CLAIMS

What is claimed is:

1. An apparatus for generating a modulated optical signal, the apparatus comprising:
a signal splitter adapted to receive and split an input data signal into first and second
5 copies;
a delay element adapted to receive and delay the first copy relative to the second copy;
and
an optical signal modulator adapted to modulate light fed to the modulator in accordance
with first and second control signals based on the delayed first copy and the second copy,
10 respectively, to generate the modulated optical signal.
2. The invention of claim 1, further comprising a differential encoder adapted to receive and
differentially encode a non-differentially encoded data signal to produce the input data signal.
- 15 3. The invention of claim 2, wherein the differentially encoded data signal is level shifted
in response to receiving a logical one in the non-differentially encoded data signal.
4. The invention of claim 2, wherein the non-differentially encoded data signal is an NRZ
data signal.
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5. The invention of claim 1, wherein the delay of the delay element is dynamically
configurable.
6. The invention of claim 1, wherein a logical one in the input data signal results in an
25 intensity pulse in the modulated optical signal, wherein the intensity pulse has a pulsewidth that
is a function of the delay.
7. The invention of claim 1, further comprising an inverter adapted to invert the delayed
first copy to generate the first control signal.
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8. The invention of claim 1, wherein the optical signal modulator is a dual-drive Mach-
Zehnder.

9. The invention of claim 1, further comprising a CW laser adapted to generate the light.

10. The invention of claim 1, wherein the modulated optical signal is a chirped-RZ signal.

5 11. The invention of claim 1, wherein the input data signal is derived from an electrical NRZ signal.

12. The invention of claim 1, wherein the delay is less than or equal to a bit period of the input data signal.

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13. The invention of claim 1, further comprising:

a first driver amplifier adapted to couple the delayed first copy to the modulator; and

a second driver amplifier adapted to couple the second copy to the modulator.

15 14. The invention of claim 13, wherein one of the first and second driver amplifiers is an inverting driver amplifier and the other is a non-inverting driver amplifier.

15. The invention of claim 13, wherein the first and second driver amplifiers are either both non-inverting driver amplifiers or both inverting driver amplifiers.

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16. The invention of claim 1, further comprising:

a CW laser adapted to generate the light;

a differential encoder adapted to receive and differentially encode an electrical NRZ data signal to produce the input data signal;

25 a first driver amplifier adapted to couple the delayed first copy to the modulator; and

a second driver amplifier adapted to couple the second copy to the modulator, wherein:

the delay of the delay element is dynamically configurable;

the delay is less than or equal to a bit period of the input data signal;

the optical signal modulator is a dual-drive Mach-Zehnder;

30 the modulated optical signal is a chirped-RZ signal;

a logical one in the input data signal results in an intensity pulse in the modulated optical signal, wherein the intensity pulse has a pulsewidth that is a function of the delay.

17. The invention of claim 16, wherein one of the first and second driver amplifiers is an inverting driver amplifier and the other is a non-inverting driver amplifier.

18. The invention of claim 16, wherein the first and second driver amplifiers are either both
5 non-inverting driver amplifiers or both inverting driver amplifiers.

19. A method for generating a modulated optical signal, the method comprising:
splitting an input data signal into first and second copies;
delaying the first copy relative to the second copy; and
10 modulating light based on the delayed first copy and the second copy to generate the modulated optical signal.

20. The invention of claim 19, further comprising differentially encoding a non-differentially encoded data signal to produce the input data signal.
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21. The invention of claim 20, wherein the input data signal is level shifted in response to receiving a logical one in the non-differentially encoded data signal.

22. The invention of claim 20, wherein the non-differentially encoded data signal is an NRZ
20 data signal.

23. The invention of claim 19, wherein the magnitude of the delay is dynamically configurable.

24. The invention of claim 19, wherein a logical one in the input data signal results in an intensity pulse in the modulated optical signal, wherein the intensity pulse has a pulsewidth that is a function of the delay.
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25. The invention of claim 19, wherein the delayed first copy is inverted prior to being
30 applied to the modulator as the first control signal.

26. The invention of claim 19, wherein the light is generated by a CW laser.

27. The invention of claim 19, wherein the modulated optical signal is a chirped-RZ signal.

28. The invention of claim 19, wherein the input data signal is derived from an electrical NRZ signal.

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29. The invention of claim 19, wherein the delay is less than or equal to a bit period of the input data signal.

30. The invention of claim 19, wherein:

10 the delayed first copy is coupled to the modulator via a first driver amplifier; and
the second copy is coupled to the modulator via a second driver amplifier.

31. The invention of claim 30, wherein one of the first and second driver amplifiers is an inverting driver amplifier and the other is a non-inverting driver amplifier.

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32. The invention of claim 30, wherein the first and second driver amplifiers are either both non-inverting driver amplifiers or both inverting driver amplifiers.

33. An apparatus for generating a modulated optical signal, the apparatus comprising:

20 means for splitting an input data signal into first and second copies;
means for delaying the first copy relative to the second copy; and
means for modulating light based on the delayed first copy and the second copy to generate the modulated optical signal.